Lincoln-Lancaster County Multi-Modal Transportation Study

Analysis of Conditions and Trends

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Lincoln-Lancaster County Multi-Modal Transportation Study Analysis of Conditions and Trends

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Chapter 1

Summary of Conditions and Trends

Demographics

Growth: Very strong population growth is forecast for the next 25 to 50 years in Lincoln. The local population is forecast to increase by almost 50 percent by the year 2025, and to double by the year 2050. This represents an increase of 103,000 and 225,000 people, respectively.

Minorities: The racial and ethnic mix of the community is increasing, although these groups are still small percentages of the total community.

Clusters: Most of the current population of the City of Lincoln is clustered in well-defined areas; however, many newer areas of the City tend to be less dense and less contiguous than older areas. Most of the current youth and senior population of the City of Lincoln is clustered in well-defined but different locations.

Income: Higher income households are concentrated around the periphery of the City with a heavy concentration of the highest income households exclusively in the eastern portion of the City while the lowest income households are concentrated in the northwest portion of the City near the airport.

Vehicle Ownership: Nearly 57 percent of households within the City of Lincoln have access to 2 or more vehicles while a little more than 7 percent have access to no vehicles. Over 68 percent of those households with access to no vehicles are one-person households.

The Transportation System and Travel Behavior

Arterial Road System: Lincoln has a very well defined system of arterial roads typically spaced one mile apart with a few of these roads continuous across the urban area such as O Street and 27th Street. These roads primarily have two to four travel lanes plus turn lanes and provide for speeds in the range of 35 to 55 miles per hour. The City plans to extend this arterial

grid pattern as the city grows, and to acquire wider public rights-of-way so as to accommodate additional turn lanes, a bicycle path, a sidewalk and more landscaping.

As the arterial grid has grown in prominence, the system of collector streets within each one-mile square (or Section) has been downplayed. The neighborhoods built after the 1960s have no defined collector street but are a maze of local streets with many three-legged intersections. This pattern makes it difficult for a bicyclist to find his or her way through the neighborhood, increasing reliance on the arterial roads. It also inhibits bus service off the arterial system.

Antelope Valley Project: The Antelope Valley Project will improve north-south auto movement on the east side of Downtown, create a shared-use trail loop around Downtown connecting major trail "spokes," and add linear parks and flood control features.

Transit Usage: Nearly 81 percent of Lincoln commuters drive alone while less than 2 percent use public transportation to get to work. The use of public transportation by those who live in the balance of Lancaster County is nearly non-existent. The use of commuting alternatives to driving alone in Lancaster County has seen a significant decrease over the last decade.

Carpooling: Although ten percent of the daily commuters carpool, the morning and evening auto occupancy rates have steadily declined since 1980. Carpooling is an equally attractive option for those living within the corporate limits of the City of Lincoln and for those living within the remainder of Lancaster County.

Daily Vehicle Miles: The estimated number of daily vehicle miles traveled in Lincoln is forecast to increase at a rate faster than the rate of population growth.

Auto-Occupancy: Peak hour average auto occupancy in the City of Lincoln is currently at an all time low. Conversely, average daily vehicle miles traveled in the City of Lincoln is currently at an all time high.

Peak-Hour Congestion: Peak-hour congestion is not a significant problem in the community, although local perception may feel otherwise.

Parking: There are significant supplies of convenient and relatively inexpensive parking in the Downtown and in other activity centers around the city.

Future Roadway: Significant growth in the number of miles of roadway is expected to meet the needs of the future land use plan. The future system will entail almost 1,800 centerline miles of roadways compared to the current level of 1,250 centerline miles.

Transit System

StarTran Ridership: At the present time, the StarTran bus system is principally oriented to serving the needs of the transit dependent (young, elderly and low income). These groups

comprise 72 percent of the total system ridership, with UNL riders comprising the remaining 28 percent. Commuters with more choice predominately tend to travel by auto because it is faster and more comfortable. Since most households need to have one or more cars for other purposes, driving to work is often perceived as free, especially if there is no charge for parking. The transit-choice riders comprise less than 4 percent of ridership presently.

Lincoln is a very auto-oriented community by virtue of its land use pattern, amount of available parking, low fuel cost, relatively low levels of congestions, and interconnected road network. Transit usage is, consequently, low. Ridership is only half of what it was in 1981, but the decline seems to have leveled off since its all-time low set in 1993. A large part of the decline since 1981 may be attributed to the national trend toward greater auto ownership, rising affluence and a more dispersed land use pattern, all while StarTran's operating costs have been steadily increasing over the same period of time.

Service Quality: Some members of the community feel that the bus system does not adequately serve all areas of the city. According to some, service is infrequent using half hour head-ways, and there is no service after 7 PM or on Sundays. Service is highly circuitous with a major transfer point in the Downtown, and movement to other locations is inconvenient and slow compared to the private auto, although transfers can be accomplished via a modified grid route on the 27th Street Shuttle and the 48th Street Shuttle. The overall cost efficiency of the StarTran bus service is comparable to that of systems in similar cities, but the use of the system is quite low. Transit is currently not time-competitive with the automobile for home-to-work trips. The average commuter trip by auto is more than 12 minutes (42 percent) shorter than the average commuter trip by transit.

Patterns: This study has revealed a consistent pattern among several variables. Those physical and demographic characteristics traditionally associated with high transit usage are clustered around the Downtown, University and the airport, generally in the northwestern and northeastern areas of the community, while the opposite characteristics tend to be clustered in the southern and eastern sides of Lincoln. Variables supportive of transit include low to moderate household income, population density, attached housing, age (young and old), rental housing, single-person households, and distance to a major employment center, schools, medical facilities, and commercial centers.

Lincoln has a strong Downtown hub, including offices, entertainment, the university, housing and the state capital complex, which aids transit ridership by providing a major, dense and walkable destination.

Efficiency: There are several inefficient and cost-ineffective routes within the system, such as the West "A" Express (Route 17x), 48th Street Shuttle (Route 18), and Arapahoe (Route 6).

StarTran operating expenses have generally increased while ridership has decreased over at least the last five years. Most of the increase in operating expenses is due to increased costs from labor contract requirements.

Demand-Responsive Transit: The Handi-Van Program provides rides at more than triple the cost per rider than the Brokerage Program.

Incentive Programs: StarTran's Employee Bus Pass Program and Alternative Ride Home Program are comparable to other such programs in cities around the country. The park-and-ride system is small in scale and limited.

Bicycling

Strengths: The bicycling environment has several strong aspects such as the 90+ miles of offroad trails in floodplains and former railroad corridors, the 26 bridges or underpasses along the trail system at arterial roads, and the interconnected pattern of local streets, especially the grid in the older neighborhoods. The trail system is well supported and planned to expand.

Trail System: The trail system is highly radial to and from the Downtown and Salt Creek, which reduces its utility for trips in other directions. There are several trail construction projects programmed that would close or reduce those gaps. The two-way paths themselves are only ten feet wide, while twelve feet would be more appropriate for areas with higher levels of usage.

On-Street Lanes: The bicycling network currently does not include on-street striped bicycle lanes which could provide a high level of service along the arterial or collector street systems and supplement the off-road trail system.

Signed Routes: The signed-only bicycle route system is extensive but could be improved to be more informative to bicyclists.

Walking

Sidewalks: Walking in Lincoln is aided by the fact that there is a sidewalk on both sides of nearly every residential street and on at least one side of nearly every arterial road. However, sidewalks in Lincoln are typically only the minimum 4 feet wide while some are discontinuous or even non-existent in newly developed areas of the city.

Interconnected Streets: Another plus for the local pedestrian is the pattern of interconnected streets, the many shade trees along most residential streets, and the relatively narrow (27 feet) residential street widths, which slow auto traffic speeds somewhat.

Long Distances: Inhibiting walking in Lincoln is the generally low to moderate density, dispersed and auto-oriented pattern of land development.

Trail System: Walkers, especially those out for recreation, take advantage of the extensive trail system.

Land Use and Development

Moderate-Density City: Lincoln is generally a moderate-density community with a high percentage of detached housing. Housing densities and diversity are highest in the neighborhoods near the Downtown, although there are a few large apartment complexes in newer neighborhoods. Growth has predominately been toward the east and south. The fact that

the Downtown is not in the center of the community is very unusual and increases the length of the average transit trip.

Patterns: Lincoln has few mixed-use or multiple-use nodes that are dense, diverse and walkable – characteristics supportive of transit. The major commercial or employment areas along transit routes are highly auto-oriented and are not well suited for transit, pedestrians or bicyclists. There is much industrial and warehousing land use on the northern and northwestern sides of Lincoln but they are low density and auto-oriented.

Urban land Area: The City has grown steadily with the population since the 1950s. If current trends are maintained, land area will need to grow by some 32 square miles for every 100,000 population increase. As a result, by 2050 the City could encompass some 150 square miles compared to about 80 square miles currently.

Comprehensive Plan Policies

Supportive Elements: The *Lincoln-Lancaster County Comprehensive Plan* includes most of the fundamental elements normally considered necessary for the growth of travel alternatives to the single-occupant automobile. These typically include:

- Strong population growth
- Staged, contiguous urban growth
- Emphasis on creating dense, mixed- and multiple-use centers (housing, office, retail)
- Interest in making those and other centers more walkable
- Serving those centers with transit
- An extensive network of off-road multiple-use paths
- Interconnected local and collector streets
- Neighborhoods that each contain a variety of housing types and densities along with neighborhood-oriented businesses
- Neighborhoods with an elementary school and/or park near the middle
- Growth of a Downtown core that is the major regional center for office employment
- A major university campus
- Emphasis on promoting redevelopment, infill development, greater density and increased diversity in the older districts and neighborhoods (including a major and immediate demonstration project in the Antelope Valley)
- Strategies for promoting walking and bicycling to and from bus stops.

Nodes Needed: The single most important task may be for Lincoln to find a way to accomplish the creation of large, dense, walkable centers (along major bus routes) that have either significant amounts of employment and/or housing and serve them with transit. Downtown is one such center. Other, emerging centers were identified in the plan.

Opportunities Presented by Growth: Urban growth and services will continue to be managed in outward-expanding rings.

The Long-Range Transportation Plan

Goals: The Mobility and Transportation chapter of the *Lincoln-Lancaster County Comprehensive Plan* emphasizes the importance of a balanced and sustainable transportation system that not only provides mobility but helps create an attractive city. It states that while the transportation system must function well for private autos and trucks, it "should also establish public transportation, bicycling and walking as realistic alternatives now and in the future." The plan also states that "as a public service, StarTran transit services should be funded and supported similar to any other public service."

The Transportation Plan calls for transit-friendly development that includes:

- Direct and continuous pedestrian connections to and from the transit stops
- Mixed-use, high density development near transit stops
- Development designs supportive of transit riders.
- A walkable environment among the activities in the immediate vicinity of the transit stops

StarTran: According to the 2025 Comprehensive Plan, StarTran route planning should:

- Near Term: Maintain the current radial network to Downtown and provide supplemental service to other portions of the urban area with convenient transfer options.
- Long-Term: Expand the modified grid system while maintaining the productive elements of the radial system serving Downtown. Reallocate less productive radial service into grid services by targeting emerging mixed-use activity centers and corridors.

Centers: The Transportation and Community Form chapters call for a higher proportion of future development to occur in "commerce centers" or "pedestrian districts" across the city. The plan calls for a mixture of land use types, a pedestrian orientation and transit opportunities. For Lincoln to become more oriented toward bus transit, bicycling and walking, the Community and Neighborhood Centers will have to increase their density, diversity, size and walkability. They will also need to more seriously consider bicycle lanes, bicycle paths and sidewalks. Presently, the commerce centers are highly auto-oriented, and some have little or no chance of being served by other modes.

Beltway: The Beltway is a planned four-lane highway on the south and east sides of Lincoln outside the present Future Growth Limit that will connect with US Highway 77 to the west and Interstate 80 to the north. The highway will be south of Saltillo Road and east of 120th Street.

Comparison to Similar Cities

Demographics

Lincoln has a somewhat lower population and smaller area than the thirteen cities selected for comparison. However, its population density (expressed as persons per square mile) is above the peer city average, which is a good characteristic for transit ridership, bicycling and walking.

Highway System

Although Lincoln is near the peer city average for its total number of road miles, it is well above average for road miles per capita and per land area. On the other hand, Lincoln is below the peer cities average for the number of miles driven daily, especially on freeways. This discrepancy may indicate that Lincoln has many miles of road that are not as heavily used as those of its peers. It is also reflective of the fact that Lincoln has relatively few miles of freeway.

Regular Transit Service

Lincoln is below the peer cities average on the measures where it would want to be higher than average, such as revenue miles per square mile and per capita, and passengers per revenue hour, per revenue mile and per capita. Likewise it is above average on expense per passenger, revenue hour and capita.

Demand-Responsive Transit Service

Similar to its situation with regular transit service, Lincoln is far below the average of its peer group for measures such as revenue miles per square mile of city and per capita, but only slightly below average for passengers per revenue hour and per revenue mile. It is above average for expense per passenger and per revenue hour, but below on expense per capita.

Transit Funding

Lincoln is well below the average of the peer cities in farebox recovery (the percentage of transit costs paid by passengers), state funding and federal funding. However, Lincoln has received federal funds for projects such as a new maintenance facility and an Automated Vehicle Location project.

Major Opportunities

This study has indicated several major opportunities for increased transit, bicycling and walking in Lincoln:

- **Reshape Transit:** The opportunity exists to present transit in Lincoln on a very different pattern and emphasize service to certain areas and corridors as opposed to blanket coverage. While this reshaping of transit could increase efficiencies, it would require a change in the overall vision of public transit in Lincoln to provide service to all unserved areas of the city.
- **Strong Growth:** The strong population growth forecast provides an opportunity to reshape future development into a pattern that is more supportive of alternative transportation modes.
- **Trail System Connections:** Several trails are about to be connected to the Downtown streets, greatly increasing their utility as a commuter system.
- **Arterial Road Trails:** Bicycle trails and pedestrian sidewalks will be included in future arterial roads that will provide connections for trails between drainage basins.
- **Commuter Service to Omaha:** A commuter rail or bus service to and from Omaha is a possibility.

Chapter 2

Analysis of Conditions and Trends

This background report about transit, bicycling and walking in Lincoln and Lancaster County will be used as a basis for the preparation of a plan to improve those systems and enhance the use of alternative transportation modes. The sections of this chapter are as follows:

- 1. Demographic Profile
- 2. Travel Behavior
- **3.** Existing Transportation Services
- **4.** Existing Bicycle System
- **5.** Existing Pedestrian System
- **6.** Existing Land Use and Urban Form
- 7. Lincoln-Lancaster County Comprehensive Plan
- **8.** Long-Range Transportation Plan for the Lincoln Metropolitan Planning Organization
- **9.** Comparison to Similar Cities

Demographic Profile

This section profiles the demographic and socioeconomic characteristics of the City of Lincoln and Lancaster County. Several variables were examined, including population density, income, patterns of growth, and the location and concentration of transit-dependent populations. The location of major employment, retail, and social service centers were also identified. All of these variables have been shown to influence transit ridership. All data used in creation of the following were derived from the 2000 Census of Population and Housing, examined at the block level, and data provided by the City of Lincoln.

The purpose of this task is to evaluate changes in the City of Lincoln and Lancaster County's geographic, economic and residential characteristics to gain a sense of the transit-dependent populations by general location and the populations that could be converted to alternative modes.

Study Area Description

The City of Lincoln and Lancaster County lie within the Platte River Valley in southeastern Nebraska. The City of Lincoln serves as both the capital of the State of Nebraska and the seat of government for Lancaster County. The City and County's 250,000 residents comprise the second largest metropolitan area in the State. The broad southeastern Nebraska region is home to over one million people, including the greater Omaha urban area to the east.

Southeastern Nebraska is experiencing a growing sense of social, cultural, and economic interdependence. The Interstate 80 corridor in particular offers a major link between the State's two largest urban areas and the region as a whole. Strengthening ties between the two cities and surrounding rural communities will be integral to the region's future success.

Population and Population Density

The City of Lincoln has always been the heart of Lancaster County; growing from 82.8 percent of the population in 1960 to 90.1 percent of the population in 2000 (see Table 1). The City of Lincoln has experienced steady population growth since 1960 (see Table 1). The remainder of Lancaster County, on the other hand, has been more variable with decreases in population (1960s), slow growth (1980s) and significant growth (1970s and 1990s) (see Table 1).

Table 1
Historical Population Change Summary (1960-2050)

	City of Lincoln	Remainder of the County	Entire Lancaster County
1960	128,521	26,751	155,272
1970	149,518	18,454	167,972
1980	171,932	20,952	192,884
1990	191,972	21,669	213,641
2000	225,581	24,710	250,291
2025	327,306	35,853	363,159
2050	474,903	52,020	526,923

Source: City-County Comprehensive Plan

Lancaster County, as a whole, grew at an average annual rate of 0.79 percent in the 1960s, 1.39 percent in the 1970s, 1.03 percent in the 1980s, and 1.60 percent in the 1990s (see Figure 1). Lancaster County, as a whole, is expected to grow at an average annual rate of 1.50 percent from 2000 to 2050 (see Figure 1).

Lancaster County is 846 square miles in land area. The land area of the City of Lincoln has been increasing over time (see Figure 4). In recent history, the City of Lincoln has been adding approximately 32 square miles of land for every 100,000 population added, and is projecting to follow that trend into the future.

Figure 1 Historical Population Change (1960-2050)

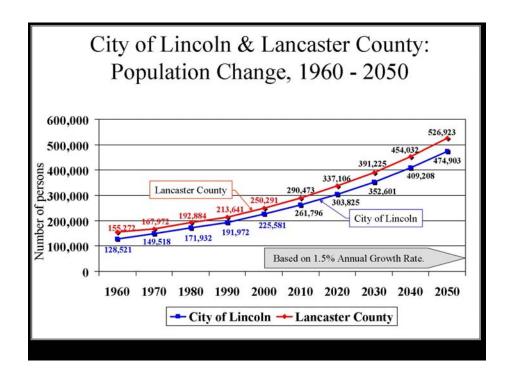


Figure 2
Population Density (per Square Mile)

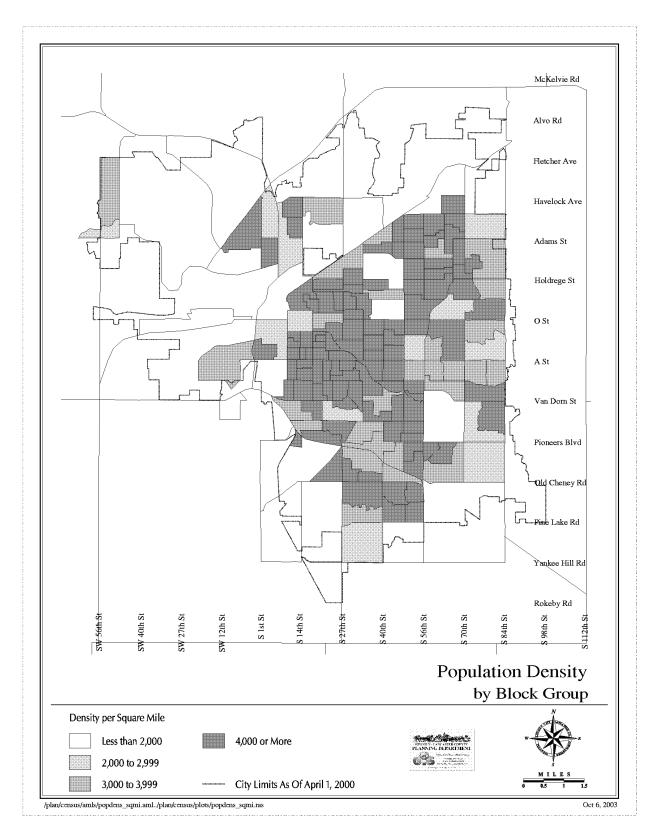


Figure 3
Population Density (per Acre)

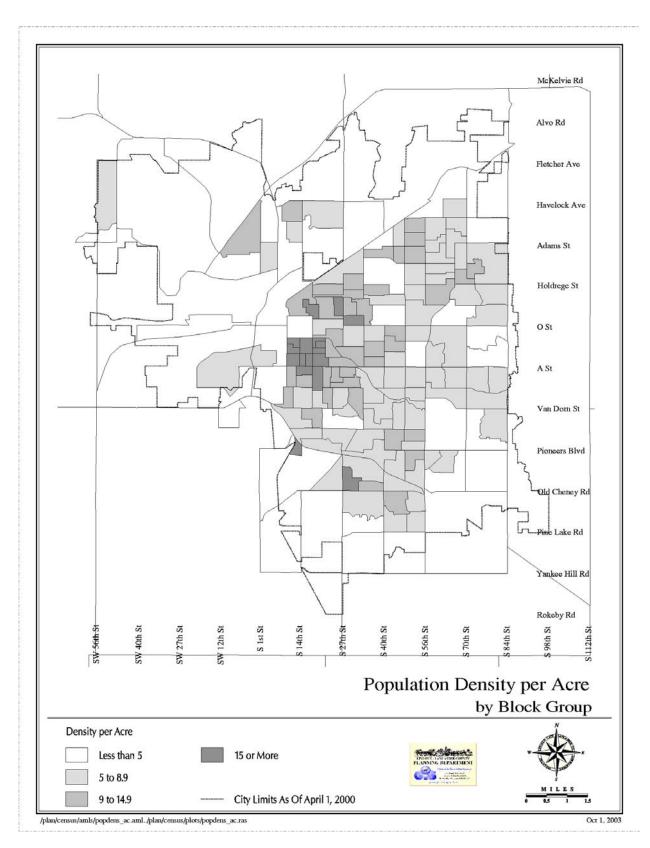
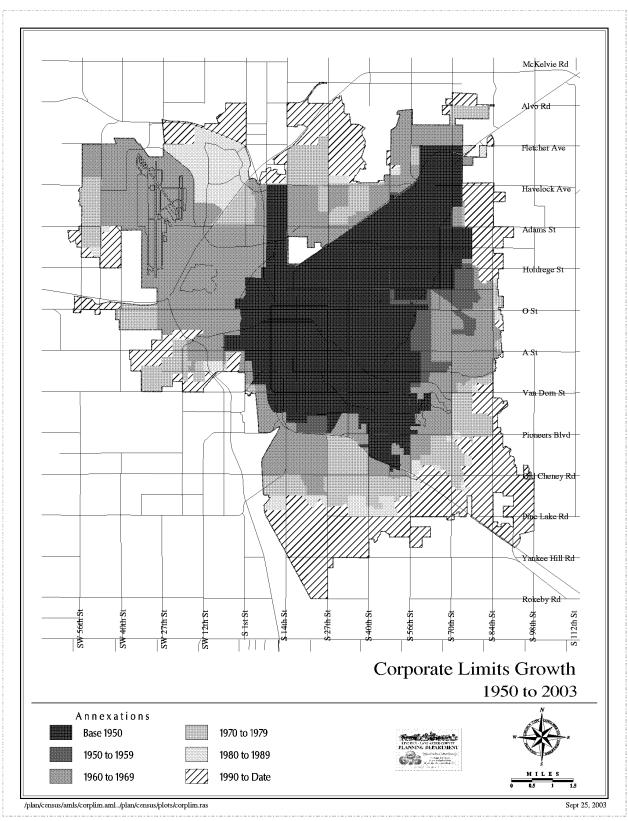


Figure 4 Historical Land Area Change (1950 – 2003)



The City of Lincoln and County of Lancaster expect to experience significant growth in housing, and students over the next quarter century (see Table 2).

Table 2
County Development Change Summary (2001–2025)

	2001	2025	Percent Change
Single Family/Duplex	70,165 DUs	98,559 DUs	40.5%
Multi-Family	28,879 DUs	44,207 DUs	53.1%
Elementary	21,690 students	31,154 students	43.6%
Secondary	17,824 students	25,489 students	43.0%
Community College	7,070 students	7,989 students	13.0%
University/College	24,813 students	33,593 students	35.4%

Source: City-County Comprehensive Plan: 2001 & 2025 Development Base Data

Senior and Youth Populations

Age can directly impact mobility, and thus transit usage. Many senior citizens cannot afford an automobile, are physically unable to drive, or prefer not to drive. The youth population also contributes to transit ridership. Along with their limited resources, youth have to cope with age restrictions and competency testing before they may obtain a driver's license. This results in a significant percentage of youths who are mobility-limited and who consider transit as a primary transportation option.

According to the 2000 Census, approximately 20.7 percent of the population are youth (ages 5-19) and approximately 10.4 percent of the population are seniors (ages 65 and over) in the City of Lincoln. The City of Lincoln has experienced a steady growth in the youth population since 1960 while in contrast the City experienced a drop in its senior population between 1970 and 1980 (see Figure 5).

The City of Lincoln's youth population is concentrated in the downtown area as well as in the north and south of the city with some pockets in the far northwest (see Figure 6). The City of Lincoln's senior population is conversely concentrated primarily in areas where the youth population is not, that being the east with some overlap in the northeast and south (see Figure 7).

Minority Population

Most of the residents of the City of Lincoln (89.2%) and Lancaster County, as a whole, (90.1%) are white. The minority population of the county is concentrated in the City of Lincoln (see Table 3). Two-thirds of the Asian population in both the city and county are either Vietnamese or Chinese.

Table 3
Minority Population

	City of Lincoln		Remainder of the County		Entire Lancaster County	
Asian	7,048	3.1%	114	0.5%	7,162	2.9%
Black	6,960	3.1%	92	0.4%	7,052	2.8%
Other	4,081	1.8%	144	0.6%	4,225	1.7%
Total	225,581	100%	24,710	100%	250,291	100%

Source: U.S. Bureau of the Census

Figure 5 Senior & Youth Population Change (1960 – 2000)

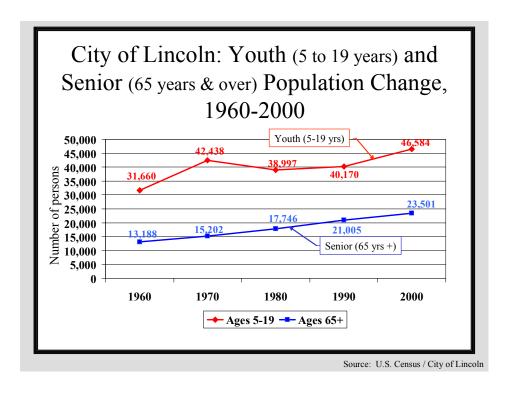


Figure 6 Youth Population Density (Ages 5-17)

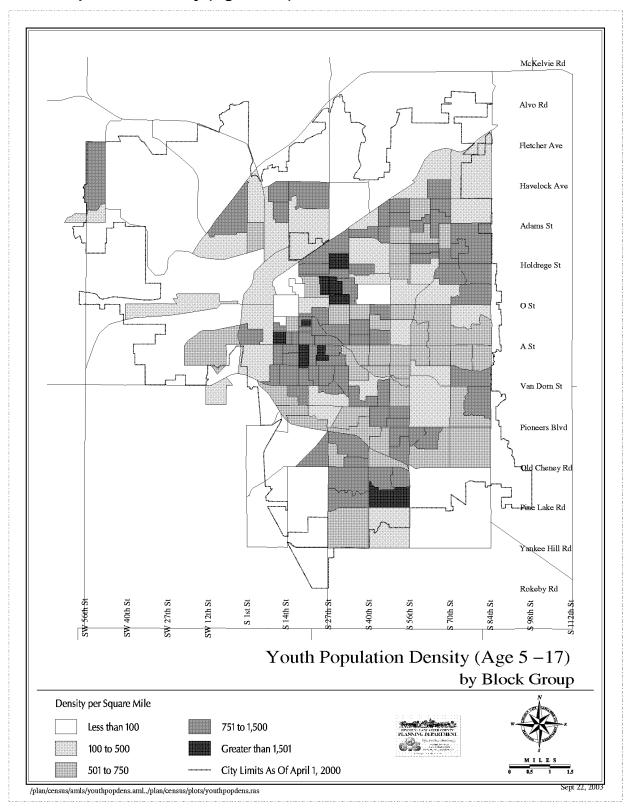
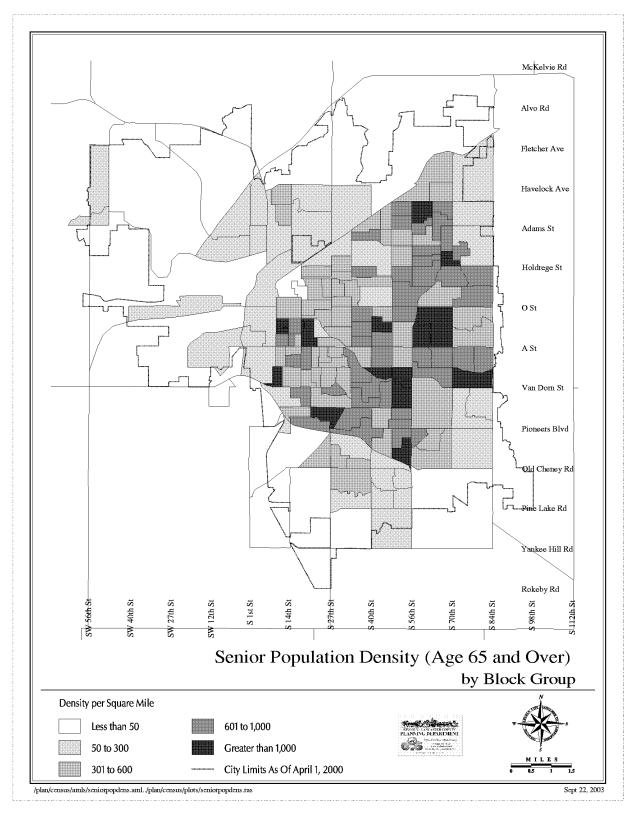


Figure 7
Senior Population Density (Age 65 & Over)



The minority population in the City of Lincoln is primarily concentrated in the downtown and northwest sections of the city with very low concentrations in the east and south (see Figure 8).

Income

Income levels also serve as a useful indicator of potential transit use. Households with lower incomes tend to have less ability to provide reliable transportation for all members of the household using the private automobile. In 2002, transportation ranked 11th out of 20 needs for low-income households in Lincoln, down from 8th in 2001 (2002 Low-Income Needs Survey).

According to the 2000 Census, the median household income for the City of Lincoln was \$40,605. This was slightly below the countywide household median income of \$41,850 and was slightly higher than the statewide household median income of \$39,250.

According to the 2000 Census, 9.6 percent of the population of the City of Lincoln lives below the poverty level. This was slightly above the countywide poverty level and was slightly below the statewide poverty level.

Table 4
Low-Income (Population below Poverty Level)

	Number Below Poverty	Percent of Total Population
City of Lincoln	21,627	9.6%
Remainder of Lancaster County	1,095	4.4%
Entire Lancaster County	22,722	9.1%
Entire State of Nebraska	161,269	9.7%

Source: U.S. Bureau of the Census

Households with median household incomes exceeding \$45,000 are primarily concentrated around the periphery of the city with a heavy concentration of households with median household incomes exceeding \$70,000 exclusively along the eastern side of the city (see Figure 9). Households with median household incomes below \$25,000 are primarily concentrated in the northwest section of the city.

Housing

The City of Lincoln has experienced a steady growth in the number of both owner-occupied and renter households since 1940 with larger growth spurts in the 1970s and 1990s (see Figure 10). The number of owner-occupied units has consistently outnumbered renter units since 1950 with the gap between the two types of units growing to just over 20,000 in 2000.

Figure 8
Minority Population Density

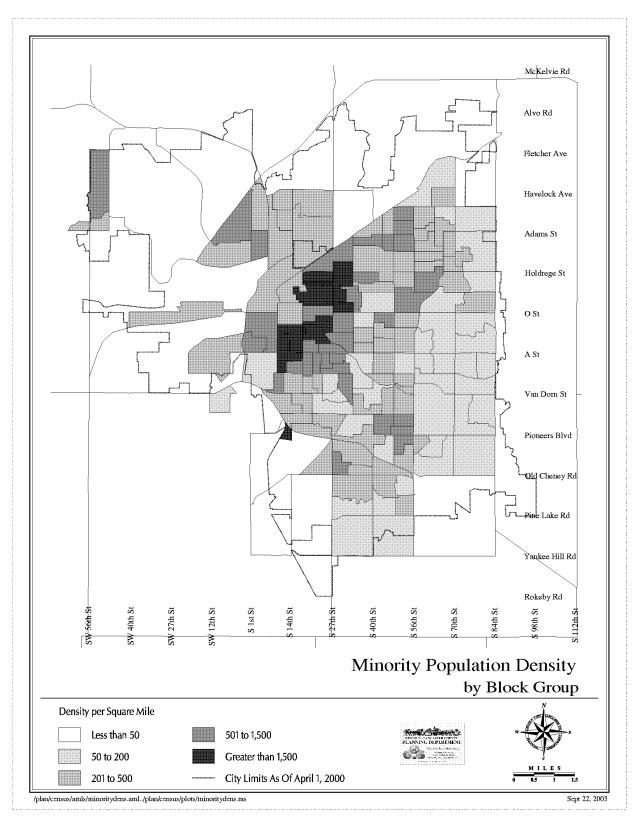


Figure 9
Median Household Income Distribution

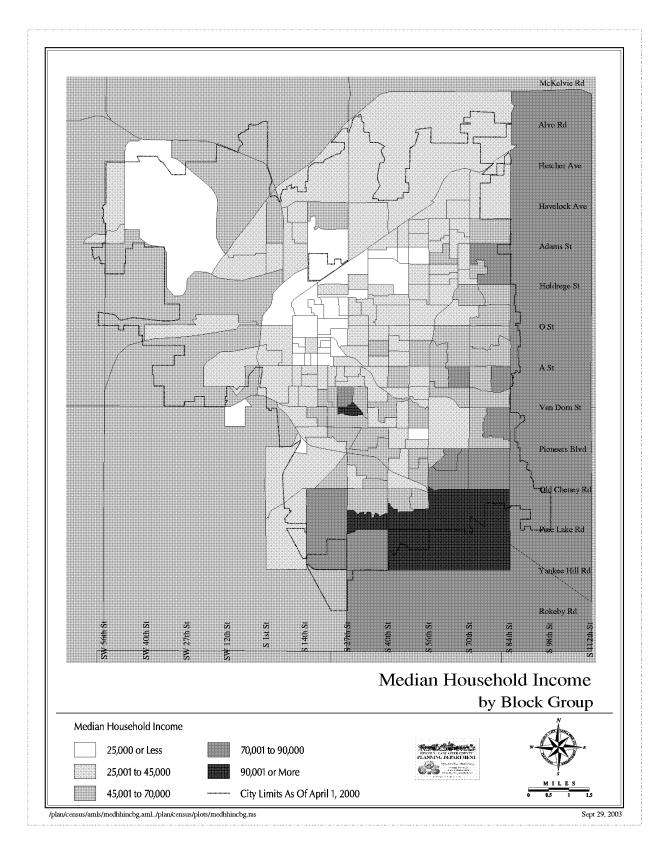


Figure 10 Household Tenure Change (1940 – 2000)

